How do we ensure food for the future?

*Trends and opportunities in policy, demography and productivity*

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How do we ensure food for the future?

• Overview
  – Prices, income and the extent of under-nutrition

• Trends and opportunities in world markets
  – Policy: government influence on food prices
  – Demography: population growth and change
  – Productivity: the green revolution and GMOs

• Conclusions
Overview of world food markets:
Prices track change in worldwide demand & supply

Nominal prices of major commodity groups, Jan. 1980-Sept. 2009

- Commodity prices tend to have brief spikes and long valleys
- So far in 2009, prices have fallen far below their 2008 spike, but could remain above recent valleys

The recent spike started
- slowly with wheat around 2003,
- faster with corn and soy in 2007,
- most suddenly for rice in 2008


Purchasing power to buy food is not evenly distributed around the world...

Who is most affected by changing food prices?

Source: www.worldmapper.org/display.php?selected=1
Note: Country sizes proportional to land area.
Purchasing power determines access to food

Here is a wallet’s-eye view of the world:

Source: www.worldmapper.org/display.php?selected=170
Note: Areas weighted by 2002 income in purchasing power parity terms.

Despite low income, undernutrition was falling ...until the 2007-09 food & financial crises

(Based on surveys of child bodyweights)  (Based on estimated food availability)

What’s behind world food markets?

We will drill into three parts of the picture:
Policy • Demography • Productivity
Policy • Demography • Productivity

We have a lot of new evidence on how governments influence food prices

The World Bank Distortions Project

• Four regional volumes published in 2008
• Two global volumes forthcoming in 2009
  • Worldwide summaries including industrialized countries
  • Political economy explanations for policy choices
• All from a three-year project, involving 100+ researchers and case studies for 68 countries, 77 commodities over 40+ years
• A massive dataset of over 25,000 government interventions for a particular product, country and year
• All available online at www.worldbank.org/agdistortions
Policy • Demography • Productivity

The big picture:
Food policies vary widely and have changed a lot

Governments in high-income countries have kept prices high, to help farmers
This tax on consumers has been cut sharply since 1990

Governments in poor countries pushed prices down to help consumers
This tax on farmers has been cut sharply since the 1980s

Policy • Demography • Productivity

Government policies tend to favor self-sufficiency and to switch from helping consumers to helping farmers

In developing countries:
The width of this gap measures policy bias towards self-sufficiency
The level of this line measures bias towards consumers as opposed to farmers

In high-income countries:
Rich countries' pro-farm bias shrank in the 1980s and 1990s
Higher lines show more help for farmers, at the expense of consumers

**Policy • Demography • Productivity**

Africa has had very large and sustained reforms since the 1990s

Figure 1.3. NRAs for Exportable, Import-Competing, and All Farm Products, 16 African Countries, 1955–2004


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**Policy • Demography • Productivity**

Asia has large pro-farm shift; ending net export taxes in 1990s, net support to ag. since 1980s

Figure 1.5. NRAs for Exportable, Import-Competing, and All Agricultural Products, Asian Focus Economies, 1955–2004

Policy • Demography • Productivity

Latin America has had similar trends at a slower pace, supporting ag. since 1990s

The policy scorecard: Big improvements, more to be done

• In 1995-2005, the world’s poorest gained from large reforms
  – in Africa, reductions in both anti-farm and anti-trade bias
  – in Asia, less increase in pro-farm bias than income growth suggested

• Substantial policy problems remain
  – e.g. for Africa, total net tax per ag. worker = $41 in 2000-04, much larger than
clear investment or foreign aid to the sector
  – dispersion and instability remain large; more uniform and stable tariffs could
reduce welfare costs for a given fiscal balance

• Gains may be fragile:
  – the 2007-08 food crisis broke trust in world markets
  – the 2008-09 financial crisis cut other sources of revenue
  – both crises could lead to higher trade restrictions
A neglected driver of change: Rural population pressure

Source: Calculated from FAOStat (downloaded 17 March 2009). Rural population estimates and projections are based on UN Population Projections (2006 revision) and UN Urbanization Prospects (2001 revision).

Looking forward: A window of opportunity in demographic change

Source: Calculated from FAOStat (downloaded 17 March 2009). Rural population estimates and projections are based on UN Population Projections (2006 revision) and UN Urbanization Prospects (2001 revision).
Policy • Demography • Productivity

Looking forward:
A window of opportunity also in urban areas

Urban population growth (decade averages), 1950-2030

Source: Calculated from FAOStat (downloaded 17 March 2009). Rural population estimates and projections are based on UN Population Projections (2006 revision) and UN Urbanization Prospects (2001 revision).

Policy • Demography • Productivity

Looking forward:
A window of opportunity from less dependency

Total dependency rates (ages 0-14 and 65+), 1950-2030

Policy • Demography • Productivity

Africa is far behind, but turning up

USDA estimates of cereal grain average yield, by region, 1961-2008

Source: Author's calculations, from grain production and area estimates for harvests in the year shown, from USDA PS&D database (www.fas.usda.gov/psdonline).


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Grain output per capita now equals South Asia’s

USDA estimates of cereal grain production per capita, by region, 1961-2008

Source: Author’s calculations. Grain production estimates are for the country’s harvest in the year shown, from USDA PS&D database (www.fas.usda.gov/psdonline), matched with mid-year population estimates from US Census Bureau, International Database (www.census.gov/ipc/www/idb).

New biotechnologies hold great promise

Policy • Demography • Productivity

Global Area of Biotech Crops, 1996 to 2008:
Industrial and Developing Countries (millions of hectares)

Approx. share of global farm area in 2008
Worldwide: 2.5% of 4.96 b. ha
Industrial Co.: 3.4% of 1.29 b. ha
Developing Co.: 1.5% of 3.67 b. ha

Global Area of Biotech Crops, 1996 to 2008,
By Crop (millions of hectares)

Policy • Demography • Productivity

New biotechnologies hold great promise but so far only for a few crops

Share of global area for that crop in 2008
Soybeans: 70% of 95 m. ha
Maize: 23% of 157 m. ha
Cotton: 46% of 34 m. ha
Canola: 20% of 30 m. ha

New biotechnologies hold great promise but so far only through a few traits

Policy • Demography • Productivity

Global Area of Biotech Crops, 1996 to 2008, By Trait (millions of hectares)


Global Status of Biotech/GM Crops (hectares in 2008)

We have contributed little to Africa’s farm productivity gains in recent years. Foreign aid to African agriculture has fallen to about US$1 per capita (vs. $4/pers. in health and $38 in total ODA). This is so low that big proportional increases are affordable.

Conclusions

How do we ensure food for the future?
Trends and opportunities

- **Farm policy: past reforms**
  - Poor countries have cut taxes on their farmers, and not (yet) raised them (much) on their consumers
    - Substantial distortions remain, could be reduced at low fiscal cost
- **Rural demography: softer headwinds**
  - Population growth is slowing
    - Africa was only major region above 2%, will soon be below 1%
    - Africa’s urban growth also slowing, from above 5% to below 4%
  - Dependency rates are falling
    - Africa’s age structure is entering an Asia-style “demographic gift”
- **Crop productivity: visible improvements in Africa**
  - Africa’s cereal yields per hectare turned up in 2000s
    - Africa’s cereal output per capita now equals South Asia’s
  - The U.S. and other donors could do much more to help!